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S O I L C O N S E R V A T I O N D I G E S T

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S O I L C O N S E R V A T I O N S E R V I C E

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CALIFORNIA-NEVADA

STEARNS
Soil Conservation Service
U. S. Department of Agriculture
Washington, D. C.

COOPERATOR PLEASED WITH SOIL EROSION CONTROL IN ORCHARD

The following letter dated August 14 was received from a cooperator in one of our project areas:

"I am writing you this letter to thank you very much for the Soil Conservation Work you have done in my orchard. When I bought this place some sixteen years ago the top soil on about one-third of the lower end of the orchard had been mostly washed away. Every fall I put in furrows and ditches with only partial success; besides, during every storm I had to get out with a shovel and often get very wet to the skin trying to stop some of the erosion.

"When I spoke to you last fall about the matter you sent your engineers who laid out a system of furrows on an even grade which took care of all the storm water last winter. There was absolutely no erosion whatever. Then this spring when you put in the concrete ditch to take care of the water from this system of furrows, the job was complete in every detail.

"I have wished for something like this in my orchard, but I never thought it would really happen. Now that it has I am more than pleased. When I look back at all the dealings we have had, I can see that you have been more than kind and patient and helpful in every way.

"The good work you are doing with these boys under you in training them in this great work certainly deserves commendation, and I am positive that it will bear fruit in the years to come....."

HIGHLIGHTS ON RECENT STORMS IN SOUTHERN NEVADA

By Arthur E. Miller, Range Examiner

Recent storms in southern Nevada are described by some of the ranchers as the "heaviest rain in 35 years," but the effect of these storms from an erosion standpoint is different than it would have been 35 years ago.

Disturbance of vegetation and soil by grazing and road building caused run-off waters from the storms to head in the direction of Lake Meade (Boulder Dam Lake) soon after hitting the soil. In the juniper belt roads,

used for hauling wood, changed to gullies. Areas that could be crossed on horseback are now cut with channels that make them practically impassable.

Approximately 75% of the vegetation on the sheep trail along the Modena Pass between Modena, Utah, and Panaca, Nevada, has been killed by overgrazing. A deep gully has cut 8 to 10 feet through the soil. Run-off from this gully is a contributing factor to the floods at Panaca. Where dams have been built on the Panaca demonstration area practically no run-off occurred in the recent storms.

From twenty miles south of Las Vegas to Caliente washout signs were put on the highway at intervals of from one to five miles. Ditches and shoulders protecting the highway were washed out. At other points run-off water either cut out the pavement or covered it with silt. Culverts in many cases were unable to carry the run-off. A considerable portion of the run-off, carrying a heavy silt load, reached Lake Meade.

Beneficial
Effect

The storms in general had a beneficial effect on vegetation. Burroweed, which made very little growth last spring, has made an excellent growth as a result of the increased moisture. All the grasses - bush muhly, big galleta, galleta, blue grama, sacaton, and others made excellent growth. Continued seasonal moisture supplies resulting in increased growth, should develop a good supply of seed. The new forage produced should be given a chance to produce a seed crop and the vigor of the plants maintained by careful grazing.

SOME INFLUENCES OF VEGETATION IN SOIL EROSION CONTROL

By P. B. Dickey, Associate Regional Agronomist
T. B. Plair, Regional Forester

(Editorial Note: This is an introduction to the part played by vegetation in erosion control. A series of articles in subsequent series of the Digest will take up more detailed phases of the program.)

Nature's
Balance

Man has been heedless of Nature's natural gifts, including vegetation. The mantle of vegetation covering steep slopes has been looked upon as an impediment to cultivation rather than as a protection to the lands be-

low. Woodland and grass areas have been overgrazed, put in cultivation, or burned over. This has disturbed Nature's balance, and soil erosion has resulted.

It is obviously impossible to put all erodible lands into native cover. However, on highly erosive slopes taken out of cultivation and in the control of gullies, the Soil Conservation Service in the California-Nevada Region has a comprehensive vegetative control program underway.

Soil A Natural Resource

The highly publicized slogan, "keep the rain-droplet where it falls," is a challenge to every person working with the soil. To those interested in preventing soil erosion and conserving moisture, and especially to those interested in vegetative control, it should be a particularly goading challenge. Our attempts to restore a normal vegetative cover to soil dying from exposure, should be as courageous as were the efforts of our forefathers in removing the cover. The pioneer's incentive to mine the soil was kindled by the desire of individual gain, and as for that matter, we are still pioneers. However, we must consider the soil as a natural resource of the nation. When we accept that and then begin to conserve by co-operative effort we should look to Nature for methods wherever possible.

Ever since the attainment of the geologic norm and prior to man's interference, Nature had in general been creating, and protecting, her soil sufficiently by a mantle of vegetative cover. From records adequate data exist to prove that Nature devised and depended upon this protection.

There are innumerable inherent characteristics of vegetation which make its use desirable for the control of soil erosion. Certain plants may be used to serve our soil conservation cause. There are many advantages in having the soil sufficiently covered with vegetation, as indicated below:

Water Erosion

1. Protection from water erosion, provided by the combination of top or crown roots and litter or dead and decaying branches and leaves. The forest offers better protection than other types of vegetation. The force of the rain is checked and the water allowed to gradually sink into the soil, rather than striking bare soil with great force and rapidly carrying away the top soil.

Wind Erosion

2. Protection from wind erosion. The vegetation constitutes a buffer between the moving force of the wind and the moveable soil particles.

3. Other major advantages which in California and Nevada, if not throughout the country, which are as important as the above mentioned are:

- a. Increase in underground storage water.
- b. Retardation of run-off and therefore a delay in flood peaks.

Of course there are many other direct and indirect advantages to vegetative cover as a means to soil erosion control, such as economic returns from woodlots in fire-wood, fence posts, poles, etc., wildlife or game management, wherein food and cover are provided for game birds and animals; range and pasture improvement, furnishing feed for livestock, under correct grazing practices; and others; uses which all combine in controlling soil erosion Nature's way--with a vegetative cover.

ADAPTATION TRIALS WITH GRASSES AND OTHER PLANTS FOR SOIL CONSERVATION IN SOUTHERN CALIFORNIA

By W. H. von Trebra, Associate Agronomist

As far as possible the Agronomy Division is using native and acclimated plants for controlling erosion in the California projects. Because the root system of perennial plants is more effective in controlling soil washing, those species of native, exotic and acclimated plants are given preference wherever they can be used.

Perennials

Many of the native perennials grow in scattered or mixed stands, making seed collection difficult. Therefore many exotics have been introduced with the hope that some might prove satisfactory until sufficient quantities of native species can be collected and seed produced.

Annuals

As a large number of annuals grow in fairly pure stands, harvesting of seed from them is relatively easy. However, many annuals are classed as producing somewhat inferior forage and all must be reestablished each season.

After gathering by hand seed of several of the desirable native species, it was soon discovered that if reseeding of areas taken out of cultivation was to become practical some other method of obtaining seed would have to be found or introduced grasses would have to be used. Adaptation studies were started in January, 1935. Those plantings of introduced grasses were made in January 1935 in the Las Posas area and two in the Arroyo Grande area, using *Stipa Pulchra* (Purple needle grass) and *Melica imperfecta* (California melic), two native perennial species, as measuring sticks.

One set of plots in the Las Posas completely failed with the exception of the two native species. All varieties on the other two sets of plots lived through the summer with reasonable stands with two exceptions - meadow fescue and sheep fescue. Plantings at Arroyo Grande lived through the summer but there was a considerable loss of plants.

Plots
Established

In order to gather more data on plant adaptations 1/100 acre plots were established in the Las Posas area in December 1935 of nineteen grasses. To test some of the grasses under slightly different conditions, seedings were made in January 1936 in the Vista, Aliso Creek and Palos Verdes areas.

Grass plantings have also been made in the northern projects. Data on adaptation and suitability for erosion control are being collected.

The Nursery Division has established seed plots of a number of the more desirable native species, hoping to produce seed in reasonable quantities cheaper than seed collected by hand from natural plantings.

At the present time *Avena* spp. (Wild oats), *Medicago hispida* (Bur clover) and *Erodium cicutarium* (Alfileria) produce the quickest cover on burned or reseeded areas and will reseed themselves satisfactorily. These annuals provide good forage and control erosion on steep slopes successfully. The main disadvantages of depending on these species are partial disappearance of the plant residue, due either to grazing of livestock or fire, and new plants have to be established each season after rains begin in the fall.

Of the commercial grass groups *Lolium multiflorum* (Italian rye-grass) produces the most rapid growth and is being used in a mixture with oats and *Medicago hispida* (Bur clover) for ditch bank seeding. *Lolium multiflorum* is also used for seeding small ditches where moisture is not the limiting factor. There are many ditches located in poor soils which carry a heavy flow of run-off for a short period only for which a more drought-resisting sod forming grass would be desirable. *Agropyron cristatum* (crested wheat grass) *Bromus inermis* (Smooth brome) and *Phalaris tuberosa* var. *stenoptera* (Harding grass) are showing some promise of being adapted to local conditions but information to date is not conclusive.

SOIL CONSERVATION SERVICE EXHIBIT TO BE ON DISPLAY AT CALIFORNIA STATE FAIR AND LOS ANGELES COUNTY FAIR

California-Nevada Region of the Soil Conservation Service will have an exhibit on display at the California State Fair, Sacramento, September 5 to September 14, and at the Los Angeles County Fair, Pomona, September 18 to October 4.

"Look At The Land"

"Look at the Land," the principal theme of the exhibit, is carried out by the use of two large figures - one a young man and the other an old man - pulling a drape back from a scene of prosperous farming. The two figures, the drape, and the "Look at the Land" motto form the background for the miniature landscape of productive fields and orchards which is spread out in the foreground. Between the two figures is a projection screen upon which is shown scenes of erosion and its control.

BRUSH AND EARTH DAMS PROVE EFFECTIVE AGAINST TORRENTIAL NEVADA RAINS

Soil Loss Prevented

Summer torrential rains hit Spring Valley with cloudburst intensity on July 10. Approximately 2500 second-feet of water ran off down Meadow Valley Wash as a result of this storm and went over two log dams under construction in Rose Valley. No damage was done to these structures, however, and there was no loss of materials or equipment nor was construction delayed although it was necessary to lay off the crews for two days and to set forward their working

schedule to include two days upon which they otherwise would not have worked. In this, as well as in a number of later floods, the post and rock revetment, recently constructed in Eagle Valley, prevented the bank cutting and loss of soils previously resulting from high water.

1188 Dams

The Ursine Dry Wash area, consisting of public domain upon which 1188 brush and earth check dams have been constructed, was subjected to a number of heavy rains during the last half of July. After two of the heaviest of these rains, only about 20 second-feet of water went by the dams into the Wash through Ursine area. Formerly, flood run-offs followed storms of similar intensity and caused considerable damage to the Ursine town farms. A run-off of 100 second-feet through Dry Wash was recorded on July 29.

SOIL CONSERVATION SURVEY

By Dr. Stanley W. Cosby, In Charge, Soil Section, Region 10

In making a soil conservation survey the conservation surveyor investigates all of the site conditions on the property under consideration, bores holes into the soil, measures the slope, etc. He prepares a map, scale 500 feet to 1 inch, showing (1) type of soil, (2) degree of slope, (3) character of erosion, and (4) crop, or method of land-use. He then draws up a brief report covering these conditions and interpreting them in terms of a general erosion control program.

Aerial photographs are used as a base for these maps whenever available. In their absence the conservation surveyor makes his map by plain table methods.

This conservation survey map is the first step in a program of erosion control--serving as the basis for land-use recommendations and for the more detailed plans and designs of the engineer, agronomist, and the forester.

Conservation Survey Laboratory

A small laboratory staff is maintained at the regional headquarters in Santa Paula to supplement and check the field observations of the conservation surveyor. Three major classes of simple studies and tests are made in the laboratory; (1) Soil analysis of the physical and chemical characteristics are made to check

and align the judgment of the field men, (2) simple tests of programs already installed on various farms to determine their efficiency, and (3) trial and model studies of materials and practices which appear to be promising but which have not yet been fully evaluated.

The laboratory results aid in the accurate interpretation of the soil conservation survey data and are often of considerable significance to the detailed plan of control as finally drafted.

SOIL CONSERVATION SURVEY MADE OF SOIL CONSERVATION SERVICE PROJECT NEAR LA HABRA

A reconnaissance soil conservation survey of the new La Habra Heights Soil Conservation Service Demonstration project is completed, and plans are underway for erosion control work on the 25,000 acre demonstration. The area is about twenty-five miles from Los Angeles in the heart of a rich farming district in Los Angeles and Orange Counties.

The project was selected with the co-operation of the California Soil Conservation Advisory Committee including the State Agricultural Extension Service and the Agricultural Experiment Station.

Land conditions in this area are representative of those existing in many of the sub-tropical fruit-growing districts of Southern California. Although the lower and more gentle slopes have been farmed for many years, intensive cultivation of steep slopes has been quite recent.

Many of these steep hills, after being broken out of native cover, have eroded rapidly. Sheet erosion in many places removed much of the top soil and gullying has also been accelerated. Highways and city streets below the area are subject to silting each winter.

In co-operation with the farmers in the area the Soil Conservation Service will carry out a comprehensive soil erosion control program.

